Investigation of malnutrition in hospitalized children: a point prevalence study from Kayseri

Original Research JCAM

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Abstract

Aim: The aim of this study is to evaluate the nutritional status of children who stayed in our hospital. Malnutrition is a clinic and pathological condition resulting from inappropriate intake of one or more nutrients to disrupt the body's physiological and metabolic balance. It is one of the most common health problems in developing countries and affects mostly children between the ages of six months and five years. Material and Method: A one-day cross-sectional survey was completed in all Pediatric Clinics of Emel Mehmet Tarman Children Health and Illness Hospital on May 16, 2017. Nutritional status of patients were evaluated. Results: Fifty-nine (49.1%) of 120 patients were female, 61/120 (50.9%) patients were male, and the ages of patients range between 1 month and 18 years and 4 months. Fifty-eight (48.3%) cases were between 1-24 months, 22 (18.3%) cases were between 2-6 years, 16 (13.3%) cases were between 6-10 years and 24 (20%) were between 10-18 years and four months. Twenty-five (20,8%) of 120 patients had malnutrition according to the Waterlow classification. Acute malnutrition was detected in 12 (48%) of 25 malnourished patients. Seven of the 12 patients (58.8%) had mild, 4 had moderate (33,3%), and 1 (8,3%) had severe acute malnutrition. Four (16%) of 25 patients had chronic malnutrition, 3/4 (75%) had severe, and 1/4 (25%) had moderate chronic malnutrition. Nine (36%) of 25 patients had chronic malnutrition with acute decompensation. Discussion: High rates of malnutrition were detected in hospitalized patients; therefore nutritional status should be carefully assessed at the moment of hospitalization to reduce the mortality and morbidity rate, and patients should be given nutritional support.

Keywords

Children; Malnutrition; Point Prevalence

Introduction

Malnutrition is a clinic and pathological condition resulting from inappropriate intake of one or more nutrients to disrupt the body's physiological and metabolic balance. It is one of the most common health problems in developing countries and affects mostly children between the ages of six months and five years.

Child malnutrition was associated with 54% of child deaths in developing countries. Unfortunately, more than 50% of children with severe malnutrition dies [1,2].

There are many factors that affect nutritional status in children. These factors may be low birth weight, premature weaning, inadequate health conditions, unfavorable socioeconomic and environmental conditions. The distribution and grade of malnutrition vary according to many factors such as the level of education, the condition of sanitation, climate and seasonal characteristics, cultural and religious habits, breastfeeding rates, the prevalence of infectious diseases, and the rate of application of community nutritional programs [3-5].

Nutritional status should first be assessed by history, physical examination, and laboratory examinations [6]. The characteristics of the diet, presence of low birth weight, duration of breastfeeding, the period of weaning, types of preparation and administration of supplementary foods, presence of chronic diseases and drugs, socioeconomic and cultural status of the family should be questioned in detail [7].

Physical examination should be done in detail, and anthropometric parameters should be measured. Growth curves of Neyzi et al. are frequently used in our country [8]. The growth of a child is best assessed by continuous anthropometric measurements, but information on the nutritional status can be obtained by comparing the values obtained with a single measurement to standards and using some calculations.

Material and Method

A one-day cross-sectional survey was completed in all pediatric clinics of Emel Mehmet Tarman Children Health and Illness Hospital, Kayseri Training and Research Hospital, Health Sciences University from Kayseri on May 16, 2017.

The age, sex, diagnosis, body weight, height, physical examination findings, characteristics of the diet, birth weight, duration of breastfeeding, period of weaning, types of preparation and administration of supplementary foods, presence of chronic diseases and drugs, socioeconomic and cultural status of the family and monthly family income were recorded.

The Waterlow classification was used for assessment of malnutrition. According to this classification; cases were accepted as acute malnutrition with a weight for height less than 90% and height for age over 95%. Cases were accepted as chronic malnutrition with a weight for height 90-110% and height for age less than 95%. Cases were accepted as acute decompensation of chronic malnutrition with a weight for height less than 90% and height for age less than 95%. Weight for height between 90% and 80% describe mild, between 80% and 70% describe moderate, and below 70% describe severe acute malnutrition [9]. The study was approved by the local Ethical Committee of the Erciyes University Medical Faculty.

Results

Fifty-nine (49.1%) of 120 patients were female, 61/120 (50.9%) patients were male, and the ages of patients range between 1 month and 18 years and 4 months.

Fifty-eight (48.3%) cases were between 1-24 months, 22 (18.3%) cases were between 2-6 years, 16 (13.3%) cases were between 6-10 years and 24 (20%) were between 10-18 years and four months. Twenty-five (20,8%) of 120 patients had malnutrition according to the Waterlow classification. Forty-eight percentage of malnourished patients were between 1-24 months. Thirteen of 25 malnourished patients were female, and 12 patients were male. Their ages ranged from 30 days to 18 years and 4 months.

Acute malnutrition was detected in 12 (48%) of 25 malnourished patients. Seven of the 12 patients (58.8%) had mild, 4 had moderate (33,3%), and 1 (8,3%) had severe malnutrition.

Four (16%) of 25 patients had chronic malnutrition, 3/4 (75%) had severe, and 1/4 (25%) had moderate chronic malnutrition. Nine (36%) of 25 patients had chronic malnutrition with acute decompensation. Twelve patients (48%) with malnutrition were following in intensive care unit.

Twenty-eight percent of the cases with malnutrition had a neurological disease, 20 % had a syndrome, 20 % had an infectious disease, 8 % had malignancy, 4 % had non-malignant hematological disorders, 12 % had an endocrine disease, 8 % inborn error of metabolism. Five patients had sepsis, and septic shock in addition to primary disease and one patient had nosocomial pneumonia. Three (60 %) of 5 patients with a syndrome had cleft palate and one had Down syndrome. According to socioeconomic status; monthly family income was low in 80% of malnourished children. Characteristics of the patients with malnutrition are shown in Table 1.

Discussion

Children who are growing and developing organisms have a higher nutritional requirement than adults. Therefore, the most severe effects of environmental conditions and nutritional deficiencies are seen in children. Death and sequelae can be prevented by early diagnosis.

Tunçbilek et al. evaluated the nutritional status of 3152 healthy preschool children from five geographical regions of Turkey [10]. Regional differences were found. Malnutrition prevalence was highest in the east (%38), lowest in the West (%10) and North (%14).

Çınar et al. evaluated 670 healthy children and reported that 15,2% of the patients were stunted and 11,8% of the patients were under-weighted [11]. The incidence of malnutrition in our study was found to be high compared to community screenings with healthy children in our country. This is because most of the patients in our study with malnutrition had chronic diseases or following in intensive care unit, and were hospitalized due to infectious diseases and/or neurological problems.

Different rates of malnutrition were reported in similar studies from different countries. Pawellek et al. evaluated 475 hospitalized children and they found that 24.1% of the patients were malnourished [12]. 17.7% of patients were mildly, 4.4% of patients were moderately, and 1.7% were severely malnourished. The largest proportion of patients with malnutrition was

Table 1. Characteristics of the patients with malnutrition

Variable	Patient n (%)
Age	
1–24 months	12 (48)
2–6 years	5 (20)
6–10 years	3 (12)
10–18 years and 4 months	5 (20)
Sex	
Male	12 (48)
Female	13 (52)
Percentage of body weight for height	
90–110	4 (16)
80–90	10 (40)
70–80	7 (28)
<70	4(16)
Percentage of body height for age	
>95	12(48)
90–95	2(8)
85-90	5(20)
<85	6(24)
Diagnosis	
Neurological disorders	7 (28)
Syndrome	5 (20)
Infectious disease	5 (20)
Endocrine disorders	3 (12)
Inborn error of metabolism	2 (8)
Malignancy	2 (8)
Hematologic disorders	1(4)

found with multiple diagnoses, mental retardation, infectious diseases and cystic fibrosis. 36% of patients with malnutrition have neurological problems in our study. Malnutrition is seen in patients with neurological disease due to oral motor dysfunction, gastroesophageal reflux, food rejection and increased energy requirements.

Hendricks et al. reported the frequency of hospital malnutrition was 24.5%, similar to our study [13]. Huong et al. reported 108 hospitalized children aged 6 months to 18, 9 years, and they found the overall rate of pediatric wasting was (19,0%), and stunting was (13,9%) [14]. Marino et al. found moderate malnutrition in 35% of 227 children hospitalized in a similar study [15].

Hospital malnutrition studies conducted with various classification from our country showed different malnutrition rates. Güleç et al. evaluated 260 children aged 1-36 months and 20.4% patients were defined as acute malnutrition, 19.2% as chronic and 7.7% as acute-chronic malnutrition according to Waterlow classification [16]. 123 patients with malnutrition were associated with infection and the most frequent infections determined were bronchiolitis (49%), pneumonia (34.8%) and acute gastroenteritis (5.4%). In our study, the most frequent infections were pneumonia and acute gastroenteritis like this study.

Öztürk et al. found the frequency of malnutrition at the time of admission to the hospital higher (31.8%) than in our study [17]. Also, Genel et al. evaluated 350 hospitalized children between 1 month and 6 years [18]. Malnutrition was found in 56.6% of the patients. Chronic malnutrition, acute malnutrition, and chronic plus acute malnutrition rates were 24.2%, 21.3%, and 1.9%, respectively.

Victoria et al. evaluated 802 children and reported a significant relationship between the income level of the family, the level of education of the father and the nutritional status [19]. Kızılyıldız et al. evaluated the relationship between socioeconomic status and malnutrition [20]. They evaluated 702 children from Van, Turkey. The prevalence of underweight, stunting, and wasting were 19.7%, 17.7%, and 16.2%, respectively. According to socioeconomic status; monthly family income was low in %19.6 of wasted children, %26 children with underweight and %36 in stunting. Monthly family income was low in 80% of malnourished children in our study.

It is known that infections are the predisposing factor for malnutrition. Malnutrition has also been shown to induce infection by reducing protein breakdown, cellular immunity, phagocyte function, complement system, secretory immunoglobulin A antibody level, and cytokine production in children. Acute gastroenteritis, respiratory tract infections, and recurrent infections lead to malnutrition by disrupting the feeding and increasing catabolism [21,22]. In our study, 20% of patients with malnutrition were hospitalized due to an infection. Five patients had sepsis, and septic shock in addition to primary disease and one patient had nosocomial pneumonia.

The prevalence of malnutrition in intensive care unit patients varies between 30% to 50% [23-25]. Malnutrition can cause complications, and that may lead to an increase in the length of stay, morbidity, and mortality. Twelve patients (48%) with malnutrition were followed in intensive care unit in our study.

In conclusion, high rates of malnutrition were detected in hospitalized patients; therefore nutritional status should be carefully assessed at the moment of hospitalization to reduce the mortality rate, and patients should be given immediate nutritional support.

Conflict of interest

None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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